Claims

1) A method for providing electrical energy to an electrical device in an environment having a first and a second temperature region comprising the steps of:

a. providing a means for transmitting ambient energy collected in said first temperature region,

b. providing a thermoelectric device having a first side and a second side,

c. providing said means for transmitting said ambient energy collected in said first temperature region in communication with said first side of said thermoelectric device, and

d. providing said second side of said thermoelectric device in communication with said second temperature region.

2) The method of claim 1 wherein said thermoelectric device is selected from the group consisting of metallic wire thermocouples, discrete element semiconductors, and thin film semiconductors assembled in alternating p- and n-type arrays, and combinations thereof.

3) The method of claim 2 wherein said metallic wire thermocouples are selected from the group consisting of iron-constantan; copper-constantan; chromel-alumel; chromel-constantan; platinum-rhodium alloys and tungsten-rhenium alloys, and combinations thereof.

4) The method of claim 2 wherein said discrete element semiconductors assembled in alternating p- and n-type arrays are connected electrically in series, parallel, and in combinations thereof.

5) The method of claim 4 wherein said p-type arrays are selected from the group consisting of bismuth telluride, lead telluride, tin telluride, zinc antimonide, cerium-iron antimonide, silicon-germanium, and combinations thereof.

6) The method of claim 4 wherein said n-type arrays are selected from the group consisting of bismuth telluride, lead telluride, cobalt antimonide; silicon-germanium, and combinations thereof.

7) The method of claim 2 wherein said thin film semiconductors are selected as having p-type materials fabricated of bismuth telluride, lead telluride, tin telluride, zinc antimonide, cerium-iron antimonide, silicon-germanium, and combinations thereof sputter deposited as thin films on a substrate; and n-type semiconductors fabricated of bismuth telluride, lead telluride, cobalt antimonide, silicon-germanium and combinations thereof sputter deposited as thin films on a substrate.

8) The method of claim 7 wherein said thin film semiconductors are selected as bismuth telluride sputter deposited as thin films on a substrate.

9) The method of claim 1 further comprising the steps of providing a second means for transmitting ambient energy collected in said second temperature region in communication with said second side of said thermoelectric device and in communication with said second temperature region.

10) The method of claim 1 wherein the step of transmitting ambient energy is performed by means selected from collecting ambient energy, focusing ambient energy, transferring ambient energy, and combinations thereof.

11) The method of claim 10 wherein the step of transferring ambient energy is performed by means selected from convection, conduction, radiation, and combinations thereof.

12) The method of claim 1 wherein the temperature difference between said first temperature region and said second temperature region is between 0.5° F and 100° F.

13) The method of claim 1 wherein the temperature difference between said first temperature region and said second temperature region is between 0.5° F and 50° F.

14) An apparatus for generating electrical energy from an environment having a first temperature region and a second temperature region comprising a thermoelectric device having a first side and a second side wherein said first side is in communication with a means for transmitting ambient thermal energy collected in said first temperature region.

15) The apparatus of claim 14 wherein said thermoelectric device is selected from the group consisting of metallic wire thermocouples and discrete element semiconductors assembled in alternating p- and n-type arrays, and combinations thereof.

16) The apparatus of claim 15 wherein said metallic wire thermocouples are selected from the group consisting of iron-constantan; copper-constantan; chromel-alumel; chromel-constantan; platinum-rhodium alloys and tungsten-rhenium alloys, and combinations thereof.

17) The apparatus of claim 15 wherein said discrete element semiconductors assembled in alternating p- and n-type arrays are connected electrically in series, parallel, and in combinations thereof.

18) The apparatus of claim 17 wherein said p-type arrays are selected from the group consisting of bismuth telluride, lead telluride, tin telluride, zinc antimonide, cerium-iron antimonide, silicon-germanium, and combinations thereof.

19) The apparatus of claim 18 wherein said n-type arrays are selected from the group consisting of bismuth telluride, lead telluride, cobalt antimonide; silicon-germanium, and combinations thereof.

20) The apparatus of claim 15 wherein said discrete element semiconductors are selected as thin film semiconductors of bismuth telluride sputter deposited as thin films on a substrate.

21) The apparatus of claim 14 further comprising a second means for transmitting ambient energy collected in said second temperature region in communication with said second side of said thermoelectric device.

22) The apparatus of claim 14 wherein the means for transmitting ambient energy is selected from an ambient energy collection means, an ambient energy focusing means, an ambient energy transmission means, and combinations thereof.

23) The apparatus of claim 22 wherein the ambient energy transferring means is selected from a convection means, a conduction means, a radiation means, and combinations thereof.

24) The apparatus of claim 14 further comprising a means for alternately storing and discharging electrical energy produced by said thermoelectric device.

25) The apparatus of claim 14 wherein said a means for alternately storing and discharging electrical energy produced by said thermoelectric device is selected from the group consisting of a battery, a capacitor, a supercapacitor, and combinations thereof.

26) The apparatus of claim 24 further comprising at least one sensor powered by electrical energy discharged from said means for alternately storing and discharging electrical energy produced by said thermoelectric device.

27) The apparatus of claim 26 further comprising at least one transmitter powered by electrical energy discharged from said means for alternately storing and discharging electrical energy produced by said thermoelectric device and capable of transmitting data gathered by said sensor.

28) The apparatus of claim 14 further comprising at least one voltage amplifiers for amplifying the voltage of electrical energy generated by said thermoelectric device.

29) The apparatus of claim 26 further comprising at least one micoprossessor capable of processing the data gathered by at least one of said sensors.

30) The apparatus of claim 26 further comprising at least one data storage means capable of storing the data gathered by at least one of said sensors.